

## MWP – Young Researcher Abstract 2023

<b>Project title:</b> Water vapour sorption behaviour of wood under load	
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<p><b>Abstract</b> (approx. 200 words):</p> <p>Most water on Earth is in the liquid or gas phase. The adsorption of water vapour (WV) leads to wood swelling and reduces the mechanical strength and stiffness of the material. Practically speaking, WV will always propagate into wood structures. This effect should be considered as fossil-based products are replaced by sustainable biomaterials, such as when replacing concrete and steel with wood for the construction industry. The design and erection of, e.g., high-rise wooden buildings for more sustainable and carbon-storing building solutions should be performed with the wood-water relationships in mind, as these kinds of constructs are subject to high-stress states.</p> <p>There is little understanding of how the WV interactions with highly stressed wood function. Therefore, knowledge about, e.g., the following is required:</p> <ol style="list-style-type: none"><li>1. How is the moisture content of wood at an increasing relative humidity affected by a tensile load parallel to the grain?</li><li>2. How is the moisture content of wood at an increasing relative humidity affected by a compressive load along the radial and tangential directions of the material?</li></ol> <p>This research aims to verify and quantify the effect WV has on the moisture distribution in wood under a mechanical load.</p>	
<b>Keywords:</b> Adsorption, compression, tension, water vapour, wood.	